

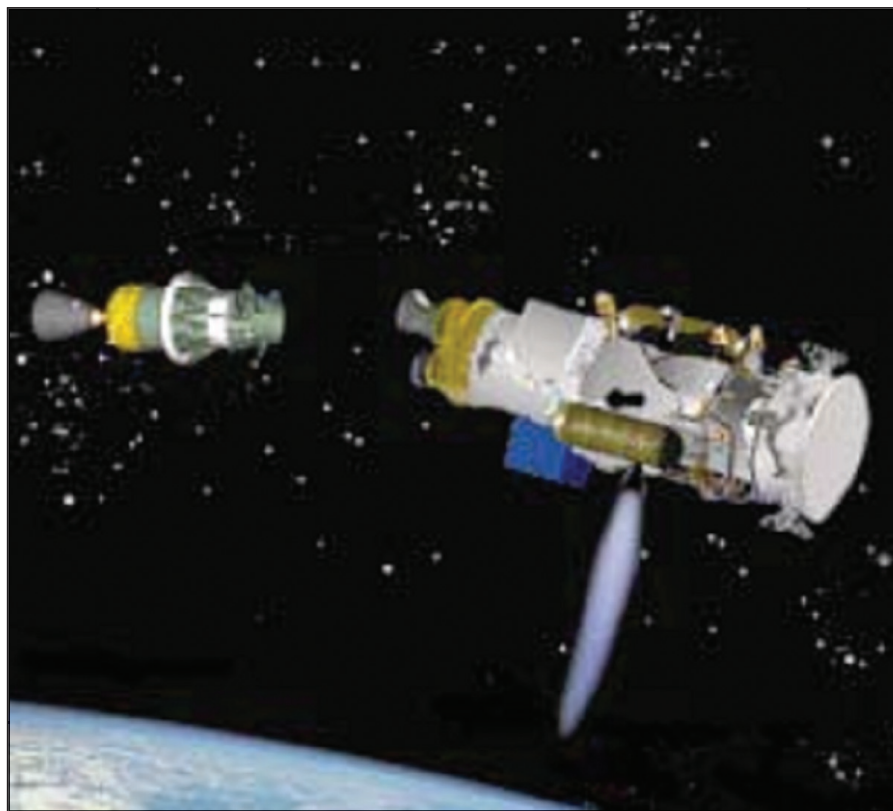


# Air Force Research Laboratory|AFRL

*Science and Technology for Tomorrow's Air and Space Force*

## **Success Story**

### **XSS-10 MICROSATELLITE DEMONSTRATION PROGRAM**



The successful completion of a miniature, 68 lb satellite's experimental mission earlier this year was an important first step in the development of a technology that promises to dramatically decrease launch costs and extend the capabilities of space vehicles. The XSS-10 microsatellite, recently launched as a secondary payload with Global Positioning System Mission IIR-8, achieved all primary objectives and transitioned important lessons learned to XSS-11 and other future microsatellite initiatives.



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## **Accomplishment**

The Space Vehicles Directorate's XSS-10 demonstration program was the first on-orbit flight demonstration of an autonomous microsatellite used to track and inspect a remote space object. Using the second stage of a Delta II rocket as its remote space object, the microsatellite acquired, photographed, and maneuvered to five different positions around the Delta II. XSS-10 relayed photographs real time from each position as it maneuvered through space without support from ground personnel.

XSS-10 also demonstrated critical new technologies including lithium polymer batteries, a miniature propulsion system, and an integrated visual camera system. The XSS-10 had capabilities similar to larger satellites, but its 3-ft. long by 18 in. circumference required developers to shrink its communication system from 12.5 to 2 lbs. and reduce its power needs to one-tenth of previous model requirements.

The team was successful in completing the XSS-10 mission objectives including inspections, powering the spacecraft on and off, and communicating with the vehicle's computer via its own ground-based control center rather than a central control center. The scientific results of the XSS-10 mission provided a critical first step toward autonomous satellite operations.

## **Background**

This demonstration marks the first in a series of future microsatellites for important missions. XSS-10 is a building block for future space operations and may lead to rapid, responsive space systems that enhance space situational awareness. Microsatellites bring affordable new capabilities to revolutionize space missions through reduced costs for development and launch.

## **Additional information**

To receive more information about this or other activities in the Air Force Research Laboratory, contact TECH CONNECT, AFRL/XPTC, (800) 203-6451 and you will be directed to the appropriate laboratory expert. (03-VS-06)